REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT #: AFRL-RHD-23-01

Exploiting Radiofrequency Electromagnetic Fields to Provide Cellular Resilience

PROJECT DESCRIPTION: The mission of our group is to investigate the fundamental mechanisms underlying the interaction of electromagnetic directed energy (DE) with biological systems. One of our goals is to exploit radiofrequency (RF) electromagnetic fields (EMFs) for induction of acquired adaptive response (AR) to confer cellular resilience. Extensive literature has described acquired AR in cells preconditioned with a mild stress exposure to a chemical, a biological, or a physical insult. The preconditioning provides cellular resilience to damage induced by an exposure to a subsequent severe stress of a same or a different insult. Our group aims to perform an in-depth investigation of RF EMF preconditioning phenomenon in cultured neuronal cells and verify its feasibility as a preconditioning agent in different stress scenarios. A few endpoints we seek to investigate include cell viability, autophagy, stress granules formation and dynamics, epigenetic imprinting, and mitochondrial function. The study will involve using various cellular and molecular biology techniques, microscopy, and bioinformatics.

ACADEMIC LEVEL: Master's, PhD

DISCIPLINE NEEDED:

- Biology
- Biomedical Engineering

RESEARCH LOCATION: JBSA-Fort Sam Houston, San Antonio, Texas

RESEARCH MENTOR: Ibtissam Echchgadda, PhD
Cellular and Structural Biology, University of Texas Health Sciences Center, 2003

Dr. Ibtissam Echchgadda is a Senior Research Biological Scientist for the Air Force Research Laboratory (AFRL), 711 Human Performance Wing, Bioeffects Division. She serves as project manager for several intramurally and extramurally funded studies that focus on understanding the biophysical and biochemical mechanisms that govern radiofrequency electromagnetic fields interaction with biological systems. Dr. Echchgadda has over 20 years of experience in different basic science and applied research. Before joining AFRL, she worked as a defense contractor for General Dynamics and before that, she served as a Research Faculty at the University of Texas Health Science Center San Antonio.
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